

WHAT IS CLAIMED IS:

1. A low profile computed tomography (CT) detector module comprising:
an x-ray transparent top layer;
an electrode on said top layer;
5 a block of direct conversion material, the electrode providing a common
bias to the direct conversion material;
a substrate material electrically connected with the direct conversion
material;
a signal processing chip electrically connected with the substrate; and
10 a connector element electrically connected to the substrate.
2. The low profile detector module of claim 1 wherein the low profile detector
module can be mechanically moved from between a first position out of the x-ray beam,
a second position wherein the low profile detector is partially within the x-ray beam and
a third position wherein the low profile detector fully overlaps the scintillator/photodiode
15 detector array in the Z axis direction.
3. The low profile detector module of claims 2 wherein the top layer and
bottom layer form a sandwich type construction with the electrode, direct conversion
material or scintillator/photodiode array, substrate and ASICS chips being contained
therebetween.
- 20 4. The low profile detector module of claim 3 wherein the detector module
further includes a first end having an end block support physically interposed between
the electrode and the substrate, said end block connector both acting a support member

and containing a connector in electrical connection with the substrate and further signal processing hardware.

5. The low profile detector module of claim 4 wherein the direct conversion material detector module is buttable.

5 6. The low profile detector module of claim 4 wherein the second end of the detector module is supported by the direct conversion material interposed between the electrode and the substrate and the direct conversion material extends to the edge of the detector module.

7. The low profile detector module of claim 4 wherein the detector module is
10 not buttable.

8. The low profile detector module of claim 7 wherein the second end of the detector module has an end support interposed between the top and bottom graphite layers.

9. The low profile detector module of claim 8 wherein a
15 scintillator/photodiode array is used in place of the direct conversion material and the electrode.

10. A low profile detector module for a hybrid scintillation/direct conversion Computed Tomography (CT) imaging system comprising:

a top x-ray translucent layer;

20 a bottom layer;

a high voltage electrode situated below the top layer;

a substrate situated over a portion of the bottom layer;

a direct conversion block interposed between and in electrical connection with the electrode and part of the substrate;

an ASICS chip in electrical connection with the substrate; and

said substrate in electrical connection with further signal processing hardware.

5 11. The low profile detector module of claim 10 wherein the low profile detector module can be mechanically moved from between a first position out of the x-ray beam, a second position wherein the low profile detector is partially within the x-ray beam and a third position wherein the low profile detector fully overlaps the scintillator/photodiode detector array in the Z axis direction.

10 12. The low profile detector module of claim 11 wherein the top layer and bottom layer form a sandwich type construction with the electrode, direct conversion material or scintillator/photodiode array, substrate and ASICS chips being contained therebetween.

15 13. The low profile detector module of claim 12 wherein the detector module further includes a first end having an end block support physically interposed between the electrode and the substrate, said end block support both acting as a support member and containing a connector in electrical connection with the substrate and further signal processing hardware.

20 14. The low profile detector module of claim 13 wherein the direct conversion material detector module is buttable.

15 15. The low profile detector module of claim 14 wherein the second end of the detector module is supported by the direct conversion material interposed between the

electrode and the substrate and the direct conversion material extends to the edge of the detector module.

16. The low profile detector module of claim 15 wherein the detector module is not buttable.

5 17. The low profile detector module of claim 16 wherein the second end of the detector module has an end support interposed between the top and bottom graphite layers.

18. A low profile detector module for a hybrid scintillation/direct conversion Computed Tomography (CT) imaging system comprising:

10 a top x-ray translucent layer having at least a bottom surface;

a high voltage electrode deposited over the bottom surface of the top x-ray translucent layer;

a bottom layer having at least a top surface;

a substrate situated over a portion of the bottom layer;

15 a direct conversion block interposed between and in electrical connection with the electrode and part of the substrate;

an ASICS chip in electrical connection with the substrate; and

said substrate in electrical connection with further signal processing hardware.

19. The low profile detector module of claim 18 wherein the low profile
20 detector module can be mechanically moved from between a first position out of the x-ray beam, a second position wherein the low profile detector is partially within the x-ray

beam and a third position wherein the low profile detector fully overlaps the scintillator/photodiode detector array in the Z axis direction.

20. The low profile detector module of claims 19 wherein the top layer and bottom layer form a sandwich type construction with the electrode, direct conversion
5 material or scintillator/photodiode array, substrate and ASICS chips being contained therebetween.

21. The low profile detector module of claim 20 wherein the direct conversion material detector module is buttable.

22. The low profile detector module of claim 21 wherein the detector module
10 further includes a first end having an end block support physically interposed between the electrode and the substrate, said end block connector both acting a support member and containing a connector in electrical connection with the substrate and further signal processing hardware.

23. The low profile detector module of claim 22 wherein the substrate is a
15 silicon substrate.

24. The low profile detector module of claim 23 wherein the substrate material is replaced with a high density flex circuit.

25. The low profile detector module of claim 24 wherein the substrate material is replaced with a multi-layer ceramic substrate.

20 26. The low profile detector module of claim 25 wherein the detector module is not buttable.

- 21 -

27. The low profile detector module of claim 26 wherein the second end of the detector module has an end support interposed between the top and bottom graphite layers.